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(56) Documents cited  
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(54) Roll ball applicator

(57) Roll ball applicator for applying liquid detergent has feed grooves 7 in the housing 1 to allow passage of detergent to the surface of the ball 11 which are sealed by contact of the ball with an annular sealing surface 6 when the applicator is not in use, the ball being urged against the sealing surface by resilient fingers 16.

Fig.1.

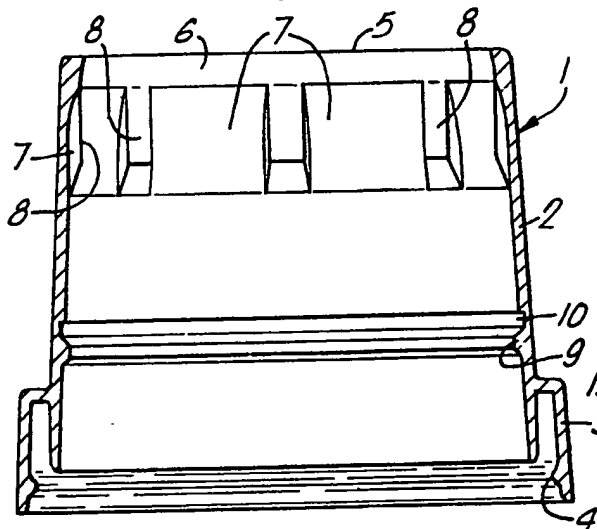
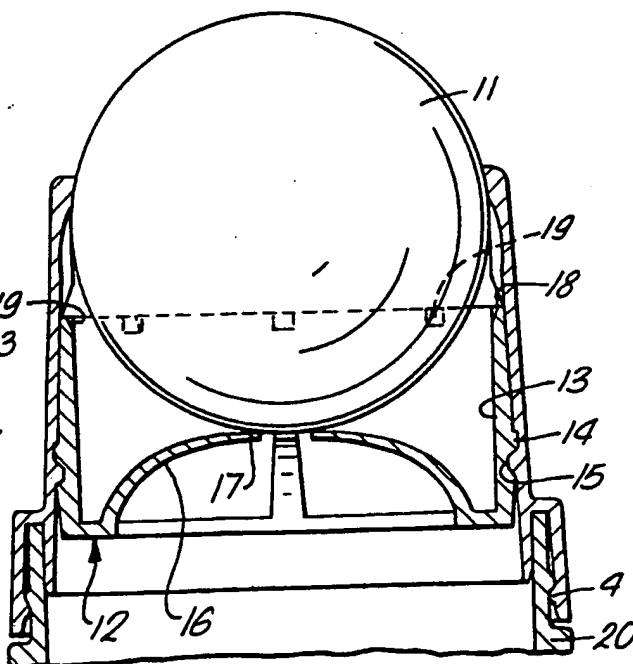


Fig.2.



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Fig.1.

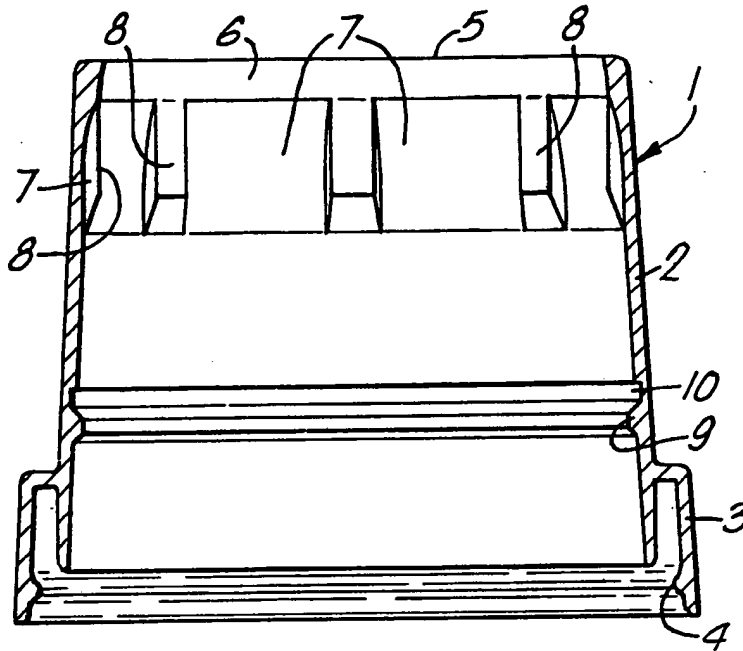


Fig.2.

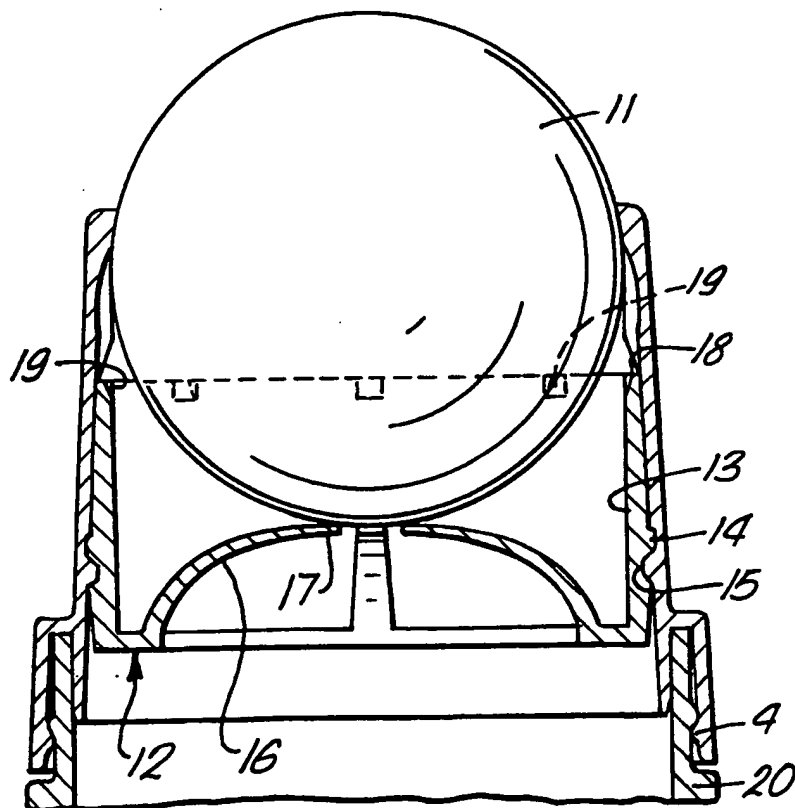


Fig. 3.

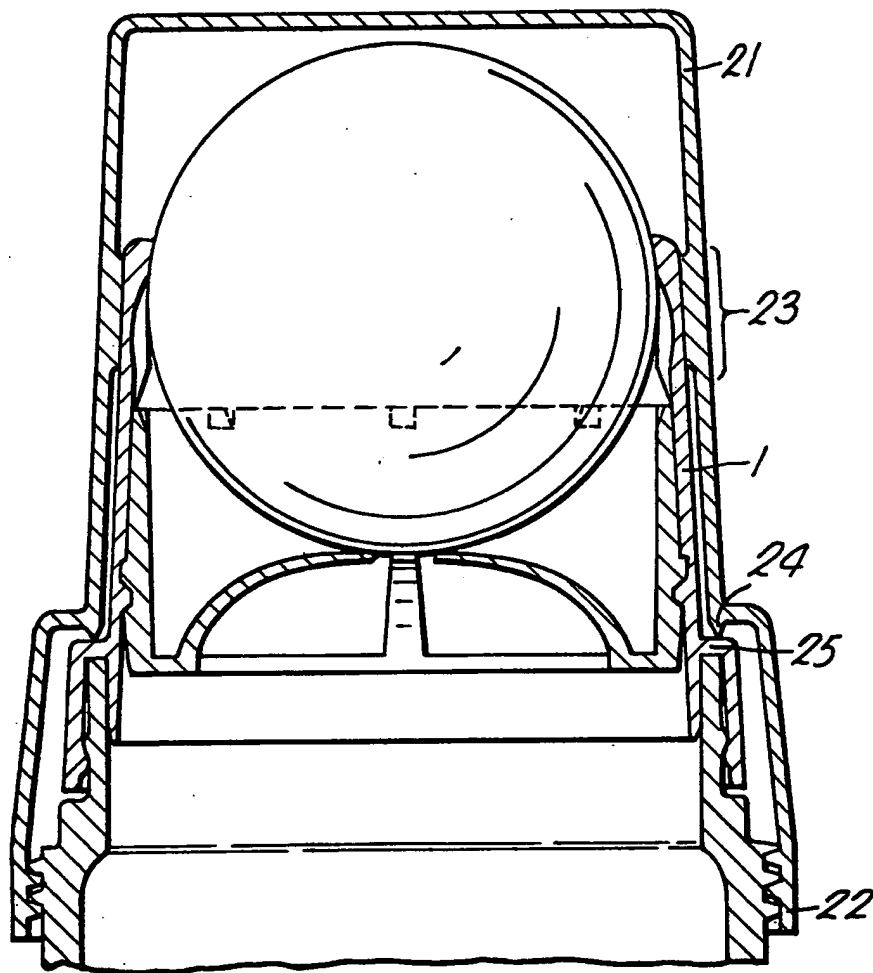
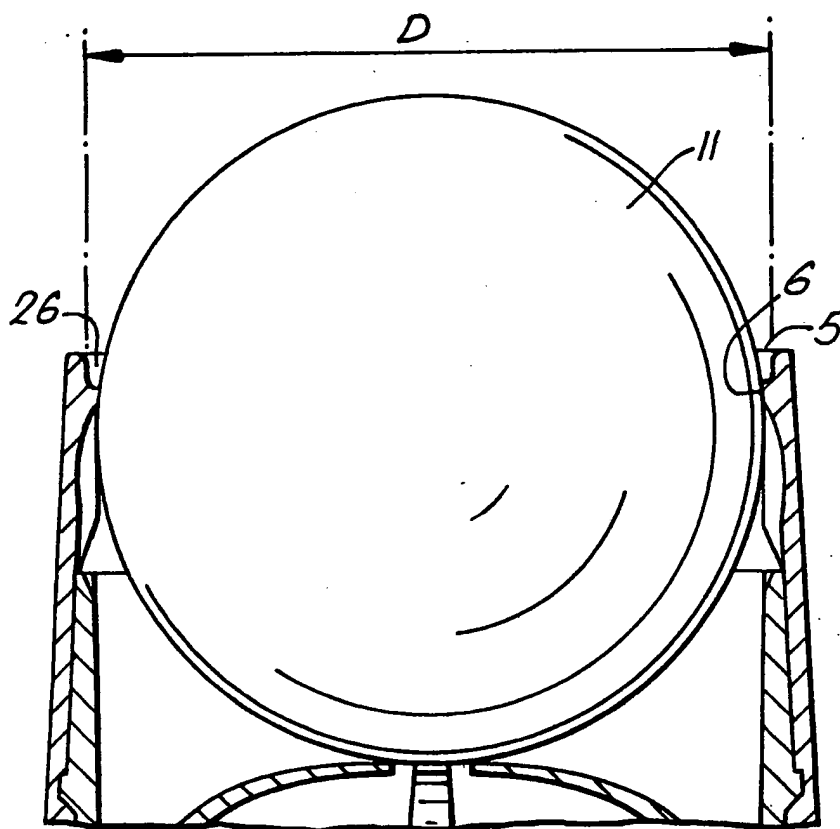


Fig.4.



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This invention relates to a roll ball applicator and particularly to a roll ball applicator for applying a liquid detergent product to a textile or similar absorbant surface.

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It can be advantageous to pre-treat particular soiled or stained areas of textile materials with a liquid detergent product prior to washing the textiles in the conventional manner either by hand or in a washing machine. An object of the present invention is to provide a device in the form of a roll ball applicator which can be used to apply such a pre-treatment to selected areas accurately and without wastage of the product through either the use of an excess amount of product or its application over an area greater than the stained or soiled areas. The device should also be sealed against leakage when not in use.

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According to the present invention there is provided a roll ball applicator comprising a container having at one end a housing having a circular opening therein, an applicator ball located within and extending outwardly  
5 from the circular opening, an inwardly facing circular sealing surface on the inside of the housing adjacent the opening and spring means resiliently urging the ball to sealingly engage the sealing surface, the inner surface of the housing below the sealing surface subsequently  
10 corresponding to the diameter of the ball and being provided with a plurality of spaced grooves extending normal to the sealing surface from below the sealing surface towards the container.

15 When the applicator is not in use the ball is urged to contact the sealing surface and seal the applicator. In use the ball is pressed against the stained area of the textile and moved relative thereto to rotate the ball. The pressure of the ball against the textile moves the  
20 ball inwardly into the housing against the spring means out of sealing engagement with the sealing surface. The position of the ball within the housing is constrained by the inner surface of the housing but as the ball rotates a quantity of the liquid contents is carried to the textile  
25 via the spaced grooves in the inner surface of the housing. The size and number of the grooves can be chosen to accurately control the amount of liquid applied to the textile.

30 The spring means can conveniently comprise a plurality of arcuate fingers having distal ends contacting the ball adjacent the innermost point of the ball within the housing, the fixed ends of the fingers being adjacent the housing. The plurality of fingers provides an evenly  
35 distributed urging of the ball for effective sealing of the ball against the sealing surface. An annular stop can

be provided which is adapted to limit the movement of the ball inwardly into the housing against the spring means and the surface of the annular stop which is contacted by the ball is preferably provided with a plurality of spaced  
5 grooves to provide flow channels across the stop when the ball is in contact therewith. Thus even if the pressure of the ball against the textile is sufficient to move the ball into contact with the stop the flow of liquid to the textile is not impeded.

10 In a particularly convenient construction the spring means and the annular stop are formed as an integral member snappingly engaged within the housing. This provides for economical manufacture and assembly.

15 The sealing surface on the inside of the housing can be spaced inwardly of the outermost edge of the opening to provide a peripheral groove between the outermost edge of the housing and the ball. Any surplus liquid product  
20 remaining on the surface of the ball outside of the housing after use and which tends to run downwards towards the housing is collected in the peripheral groove and prevented from running down the outside of the housing or otherwise collecting on the applicator and creating a  
25 messy applicator.

The applicator can be provided with an overcap adapted to be releasably secured to the applicator to cover the ball, the overcap contacting the housing in the  
30 closed position to increase the sealing contact between the sealing surface and the ball. To minimise the risk of liquid product drying out on the ball between uses the overcap can be provided with an annular fin seal engagable with an outwardly extending shoulder on the applicator  
35 when the cap is in the closed position.

The invention will now be more particularly described with reference to the accompanying diagrammatic drawings in which:-

5        Figure 1 is a sectional elevation of a housing,

      Figure 2 is a sectional elevation of an assembled applicator using the housing of Figure 1,

      Figure 3 is a sectional elevation of the applicator of Figure 2 together with an overcap and

10       Figure 4 is a view similar to Figure 2 of an alternative embodiment.

      Referring to Figure 1 there is shown a housing 1 comprising a substantially circular cylinder body member 2  
15       housing at one end an outwardly spaced skirt 3 adapted to be connected to the neck of a container by an inwardly facing annular rib 4. At the opposite end of the body member 2 is a circular opening 5, the inner surface of the body adjacent the opening having sealing surface 6  
20       extending continuously around the body and shaped to retain a roll ball within the housing. Below the sealing surface the inner surface of the body is formed with a plurality of grooves 7 normal to and extending from below the sealing surface towards the opposite end of the body.  
25       The innermost surfaces 8 of ribs formed between the grooves 7 form a right circular cylinder having a diameter greater than the diameter of the opening 5. Also provided in the inner surface of the body are a rib and groove 9,  
10       10 respectively by which a combined spring and stop means 12 as hereinafter described can be located within the  
30       housing.

      Figure 2 shows the housing of Figure 1 with a ball 11, spring means and stop 12 assembled therein. The ball  
35       11 extends outwardly of the housing and is retained therein by the sealing surface 6 at the opening 5 having a



smaller minimum diameter than the minimum diameter of the ball. The combined spring means and stop 12 comprises an annular body 13 having externally a rib and groove 14 and 15 complementary to the rib and groove 9, 10 in the housing to snappingly locate therewith. Four arcuate fingers 16 are fixed at one end to the body 13 and extend upwardly and inwardly so that their distal ends 17 contact the underside of the ball adjacent the innermost point of the ball within the housing. The upper annular edge 18 of the body 13 forms a stop member limiting the inward movement of the ball within the housing. The edge 18 is interrupted by a plurality of slots 19 which permit liquid to flow past the edge 18 even when the ball is in contact therewith.

As shown in Figure 2 the housing fits over the top of the neck of a container 20 and is snappingly engaged therewith by the annular rib 4.

In use the container is inverted and the ball pressed against the article to be treated with the product contained within the container. The product contacts the ball within the housing and as the ball 11 is pressed against the article it moves inwards away from the sealing surface 6. When the ball is out of contact with the sealing surface 6 it is maintained in its predetermined position by the surfaces 8 which together form a right circular cylinder having a diameter substantially corresponding to the diameter of the ball 11. Thus the gap formed between the sealing surface 6 and the ball 11 is constant all around the ball irrespective of the direction in which the ball is caused to rotate by movement of the applicator relative to the article. The product is therefore free to pass through the grooves 7 and is metered onto the outer surface of the ball by the width of the gap between the ball and the sealing surface.

In the event of the ball being pressed inwardly a distance such that it contacts the annular stop 18 the product can still pass through the slots 19 to reach the surface of the ball inside the opening 5 of the housing.

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After use the spring means formed by the four arcuate fingers 16 urges the ball 11 into sealing contact with the sealing surface to close the container.

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The applicator can be provided with an overcap 21 which as shown in Figure 3 is threadably secured at 22 to the container. Within the overcap a contact zone 23 is provided which, when the cap is in the closed position, contacts the outside of the housing 1 in the region of the sealing surface to increase the sealing engagement thereof with the ball 11. Further improved sealing of the cap to minimise drying out of any product remaining on the ball outside of the housing after use is provided by an annular fin seal 24 on the overcap which contacts an external shoulder 25 formed by the skirt 3 on the housing.

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Referring now to Figure 4 there is shown an enlarged side view similar to Figure 2 in which the sealing surface 6 is spaced below the opening 5 in the top of the housing 1. The diameter D of the opening 5 at the outermost end of the housing is greater than the corresponding diameter of the ball so that an annular groove 26 is formed around the periphery of the opening between the housing and the ball. This peripheral groove serves to collect any liquid product remaining on the ball and which runs down the ball after use, the groove minimising any tendency for such liquid reaching the outside of the housing and creating messy conditions.

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The applicator described above is particularly suitable for containing a liquid detergent product and

provides a means for simply applying the product to stained or soiled areas of textiles without wastage arising from the use of excess product or from applying the product over a larger area than is necessary.

## CLAIMS

1. A roll ball applicator comprising a container having at one end a housing having a circular opening therein, an applicator ball located within and extending outwardly from the circular opening, an inwardly facing circular sealing surface on the inside of the housing adjacent the opening and spring means resiliently urging the ball to sealingly engage the sealing surface, the inner surface of the housing below the sealing surface corresponding to the diameter of the ball and being provided with a plurality of spaced grooves extending normal to the sealing surface from below the sealing surface towards the container.
2. A roll ball applicator according to claim 1 in which the spring means comprises a plurality of arcuate fingers having distal ends contacting the ball adjacent the innermost point of the ball within the housing, the fixed ends of the fingers being adjacent the housing.
3. A roll ball applicator according to claim 1 or claim 2 having an annular stop having a surface adapted to be contacted by the ball to limit the movement of the ball inwardly into the container against the spring means.
4. A roll ball applicator according to claim 3 in which the surface of the annular stop contacted by the ball is provided with a plurality of spaced grooves to provide flow channels across the stop when the ball is in contact therewith.
5. A roll ball applicator according to claim 3 or claim 4 in which the spring means and the annular stop are formed as an integral member snappingly engaged within the housing.

6. A roll ball applicator according to any one of the preceding claim in which the sealing surface is spaced inwardly of the outermost edge of the opening, a peripheral groove being formed between the outermost  
5 edge of the housing and the ball.

7. A roll ball applicator according to any one of the preceding claims including an overcap adapted to be  
10 releasably secured to the applicator to cover the ball, the overcap contacting the housing in the closed position to increase the sealing contact between the sealing surface and the ball.

15 8. A roll ball applicator according to claim 8 in which the overcap is provided with an annular fin seal engagable with an outwardly extending shoulder on the applicator when the cap is in the closed position.

20 9. A roll ball applicator according to any one of the preceding claims in which the housing is snappingly engaged with the container.

25 10. A roll ball applicator according to any one of the preceding claims containing a liquid detergent product.